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Description of Eleven New Species of the Genus *Coelotes* (Araneae: Amaurobiidae) from the Ryukyu Islands, Japan

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Abstract — Eleven new species of the genus *Coelotes* from Okinawa, Miyako, and the Senkaku Islands in the Ryukyus are described: *Coelotes keramaensis, C. tonakiensis, C. aguniensis, C. miyakoensis, C. senkakuensis, C. motobuensis, C. shimajiriensis, C. iheyaensis, C. yambaruensis, C. izenaensis* and *C. kumejimanus*.

Key words — Araneae, Amaurobiidae, *Coelotes*, new species, Senkaku Islands, Ryukyu Islands, Japan.

Introduction

Until 1982, no coelotine spiders were reported from the Ryukyu Islands (Bösenberg & Strand 1906; Nishikawa 1974; Paik 1978; Yaginuma 1977, 1986). Since then, only five species of the genus *Coelotes* were reported from the Ryukyu Islands (Shimojana 1982, 1989; Yaginuma et al. 1990, Wang & Ono 1998). The ranges of distribution of these species are rather restricted, each species must be considered as endemic in the Ryukyu Islands, because the spiderlings of the genus *Coelotes* do not disperse by ballooning as in most mygalomorph spiders (Shimojana & Haupt 1998).

A series of surveys in the Ryukyu Islands from 1970 to 1999 yielded many undescribed coelotine spiders from this area. Five species among them were described previously (Shimojana 1982, 1989). The remaining eleven species are described in this paper. All the specimens used were collected by the author unless otherwise noted.

Abbreviations used in the text and on figures.

Chelicerae: Marginal teeth — promargin/retromargin (p/r).

Eyes: AER = anterior eye row, AME = anterior median eyes, ALE = anterior lateral eyes; PER = posterior eye row, PME = posterior median eyes, PLE = posterior lateral eyes; MOAH = height of median ocular area; MOAW = width of median ocular erea. NSMT = National Science Museum Tokyo.

Legs: Fe = femur, Pa = patella, Ti = tibia, Mt = metatarsus, Ta = tarsus, Uc = upper claws, Lc = lower claw; Tricho. = trichobothria; R or (r) = right, L or (l) = left; weak(w); Measurements of legs are in mm, numbers of teeth and trichobothria on tarsal claws (Uc, Lc) of left legs = (Fe/Pa/Ti/Mt/Ta//Total/Uc + Lc + Tricho); Spiniformation of legs in text as shown in Fig. 2.

Male copulatory organs: c = conductor, ed = end of conductor, e = embolus, ma = median apophysis, pa = patellar apophysis, ta = tibial apophysis, cf = cymbial furrow. Female genitalia: p = projection, at = atrium, co = copulatory opening, cd = copulatory duct, ss = stalk of the spermatheca, hs = head of the spermatheca, bs = base of the spermatheca.

Hairs on copulatory organs and chelicera are omitted from illustration.

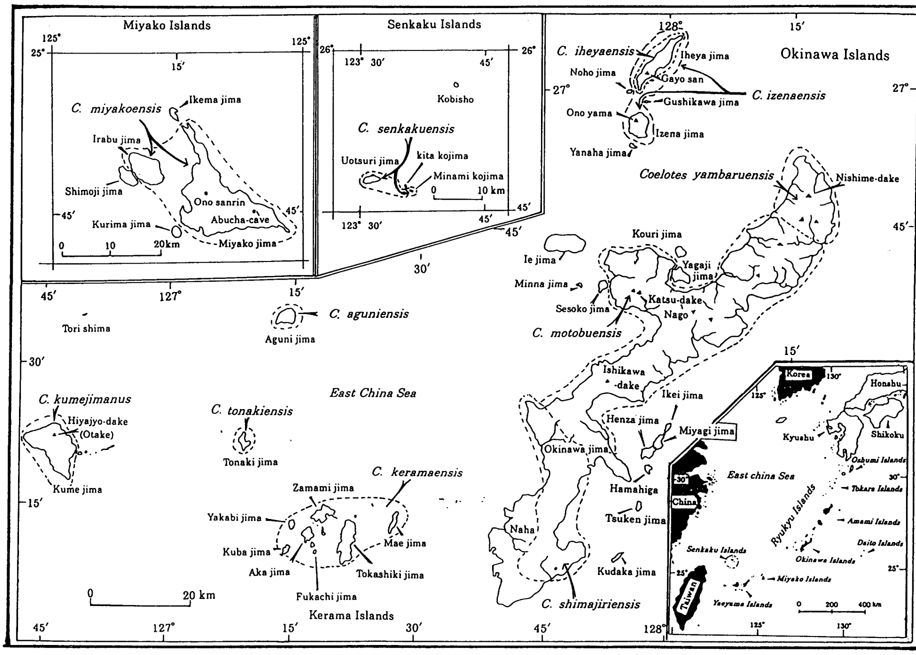


Fig. 1. Maps of the Okinawa (insert adjacent islets), Miyako and Senkaku Islands, representing distribution of *Coelotes* species described in this paper.

Description

Coelotes keramaensis n. sp.

[Japanese name: Kerama-yachigumo]

(Figs. 3–12)

Etymology. The specific name is derived from the Kerama Islands, group of islets in the southwest of Okinawa Island.

Types. Male holotype and female allotype, Tokashiki-jima, Kerama Islands, Okinawa Pref., Japan, 18, October 1983; deposited in NSMT.

Diagnosis. The range of total length of this new species are in male 6.2–8.1 (n= 5, $\bar{x}=7.0\pm0.7$ SD), in females 7.0–7.4 (n=6, $\bar{x}=7.2\pm0.2$ SD), middle-sized coelotine spider. Genital structure similar to *Coelotes aguniensis* n. sp. but can be distinguished from the latter by the large knife-shaped epigynal projections (Figs.10–11), shape of patellar and tibial apophysis, and apical shape of the embolic conductor of the male palp (Figs. 5–7, 9).

Description. Holotype male: Total length 6.8, carapace 3.5 long, 2.6 wide; sternum shield shaped, 1.6 long, 1.4 wide, labium wedge shaped, 0.4 long, 0.5 wide; height of clypeus 0.2, with 6 long bristles; cheliceral promargin with 4 teeth (right 5); left retromargin 3(right 4)(Fig.4); cervical groove, radial furrows and median furrow apparent (Fig. 3). AER strongly procurved, PER slightly procurved or straight seen from upper; AER slightly procurved, PER strongly procurved from frontal view; order of eye sizes ALE> PLE>PME>AME; interdistances of eyes AME-AME 0.04, AME-ALE 0.04, PME-PME 0.10, PME-PLE 1.00, ALE-PLE 0.06; MOAW>MOAH: Leg I 3.6/1.3/3.3/3.5/

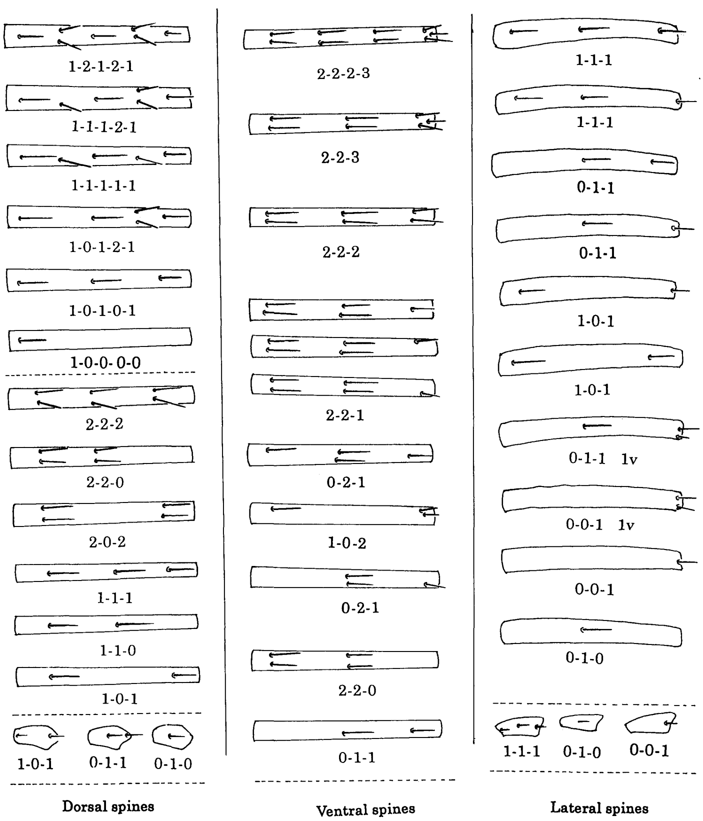


Fig. 2. Diagramatic representation of spiniformation of legs.

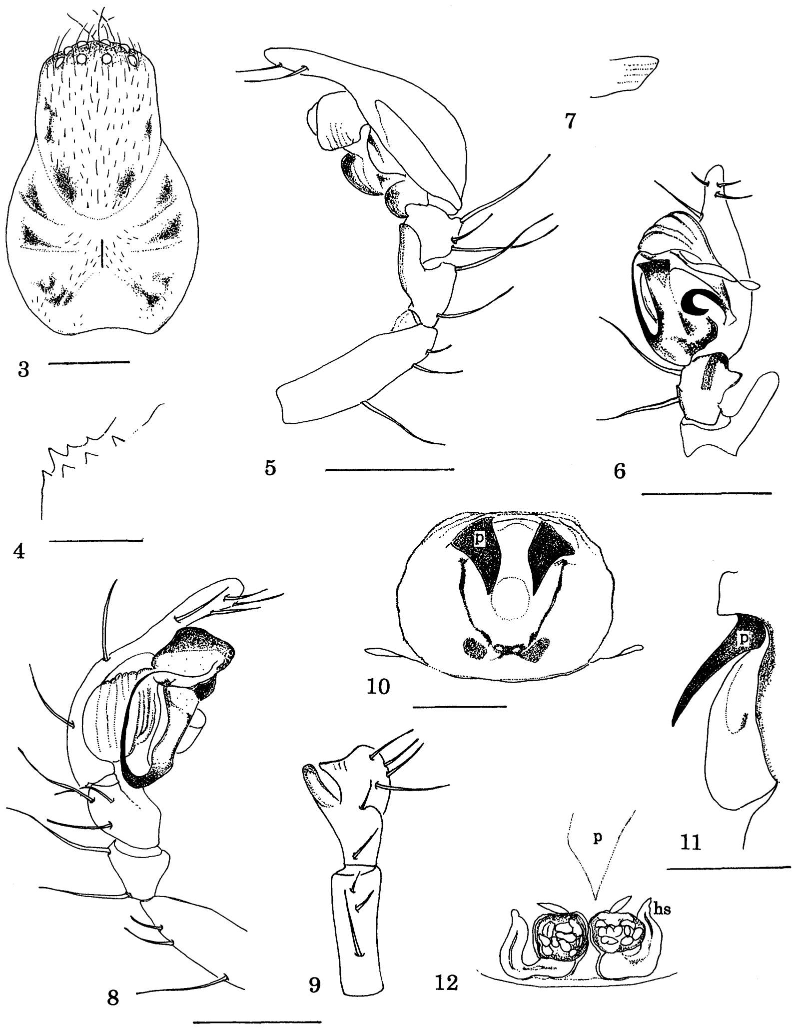
1.9/13.6//9(9)/3/7; Leg II 3.2/1.2/2.5/3.0/1.7/11.6//8(8)/3/7; Leg III 2.9/1.2/2.3/2.9/1.4/10.7//8(8)/3/7; Leg IV 4.0/1.2/3.4/4.2/1.7/14.5//9(9)/3/8. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1, 2, 4 1-0-1-2-1, 3 1-1-1-2-1; Pa 1-4 1-0-1; ti 3-4 1-0-1; Mt 3 2-2-2, 4 2-2-3. Ventral: Ti 1, 2 2-2-1, 3, 4 2-2-2; Mt 1 2-2-3, 2 2-1-1, 3, 4 2-2-2. Prolateral: Pa 3 0-1-0, 4 1-0-1; Ti 3-4 0-1-1; Mt 3 0-1-1, 4 1-1-1. Retrolateral: Fe 1 0-1-0; Pa 4 0-1-1, Ti 2-4 0-1-1; Mt 1 0-0-1, 3, 4 0-1-1; Ta IV 0- 1-0.

Male palp (Figs. 5–9): Patellar apophysis long, blunt, dorsum concave (Fig. 9); retrolateral tibial apophysis small, pointed (Fig. 6); embolus normal, filiform; distal end of embolic conductor twisted (Figs. 6, 8); lateral cymbial furrow large and deep, dorsal end concaved (Fig. 5).

Markings and coloration: Greyish black coloured markings on the carapace as shown in Fig. 3; dorsum of opisthosoma with two chevron markings, apparent. All legs with blackish ring flecks on femora and tibiae, 1 on patellae.

Female allotype: Total length 7.3, carapace 3.7 long, 2.6 wide; sternum 1.6 long, 1.4 wide; labium 0.4 long, 0.5 wide; height of clypeus 0.2, with 8 long bristles; both cheliceral promargin with 6 teeth, retromarginal teeth 4 (right 5); AER and PER same as in



Figs. 3–12. *Coelotes keramaensis* n. sp., male holotype (3–9) and female allotype (10–12). —— 3, carapace; 4, left cheliceral teeth. 5–9, Left palp: 5, lateral; 6, ventral; 7, distal end of conductor seen from above; 8, retrolateral; 9, dorsal view of femur, patella and tibia. 10–11, Epigynum: 10, ventral; 11, lateral; 12, dorsal view of internal genitalia. Scale bars = 1 mm except for 3 (0.3 mm).

holotype; order of eye sizes ALE = PLE > PME > AME; interdistances of eyes: AME-AME 0.04, AME-ALE 0.04, PME-PME 0.10, PME-PLE 0.12, ALE-PLE 0.06; MOAW > MOAH: LegI 3.0/1.1/2.7/2.6/1.4/10.8//12(13)/3/6; Leg II 3.0/1.2/2.3/2.6/1.4/10.5//14(14)3/7; Leg III 2.6/1.1/2.0/2.5/1.2/9.4//14(13)/4/6; Leg IV 3.6/1.2/3.0/3.6/1.5/12.9//12(12)/4/7. Leg formula 4 , 1 , 2 , 3.

Spiniformation of left legs. Dorsal: Fe 1 1-1-1-0-0, 2 1-1-1-2-1, 3 1-1-2-2-1, 4

1-0- 1-2-1; Pa 1, 2 0-0-1, 3, 4 1-0-1; Ti 3, 4 1-0-1; Mt 2 0-1-1, 3, 4 2-2-2. Ventral: Ti 1, 3 2-2-1, 2, 4 2-2-2; Mt 1, 2 2-2-2, 2, 4 2-2-1, 3 2-2-2. Prolateral: Fe 1 0-0-1; Pa 3, 4 0-1-0; Ti 1 1-0-0, 3, 4 0-1-1, Mt 1, 2 0-0-1, 3, 4 1-1-1. Retrolateral: Fe 1 0-1-3, Pa 3, 4 0-1-0; Ti 1 0-0-1, 2-4 0-1-1; Mt 1, 4 0-0-1, 2, 3 0-1-1, Ta 3, 4 0-0-1.

Female internal genitalia (Figs. 10, 12): Atrium ellipse, central part raised (Figs. 10-11); epigynal projection large, knife-shaped, stout, long, sharply pointed, close together; spermathecae convoluted, spermathecal head small, spermathecal bases large, slightly separated (Fig. 12)

Markings and coloration of allotype generally same as in male holotype.

Other materials examined. 4 males 18, October 1983; Tokashiki-jima, Kerama Islands, 4 females Tokashiki-jima, Kerama Islands. 1 November 1982.

Biology. This new species live in cliffy habitats, under stones of bush or wood. Both males and females construct a tubular nest among stones or litter of leaves in the wood.

Distribution. Kerama Islands of the Ryukyu Islands, Japan,

Coelotes tonakiensis n. sp.

[Japanese name: Tonaki-yachigumo]

(Figs. 13-22)

Etymology. Named after Tonaki-jima, an islet located in the midpoint among Kerama-jima, Aguni-jima and Kume-jima.

Types. Male holotype and female allotype, Tonaki-jima, Okinawa Islands, Okinawa pref., Japan, 22 October 1983; deposited in NSMT.

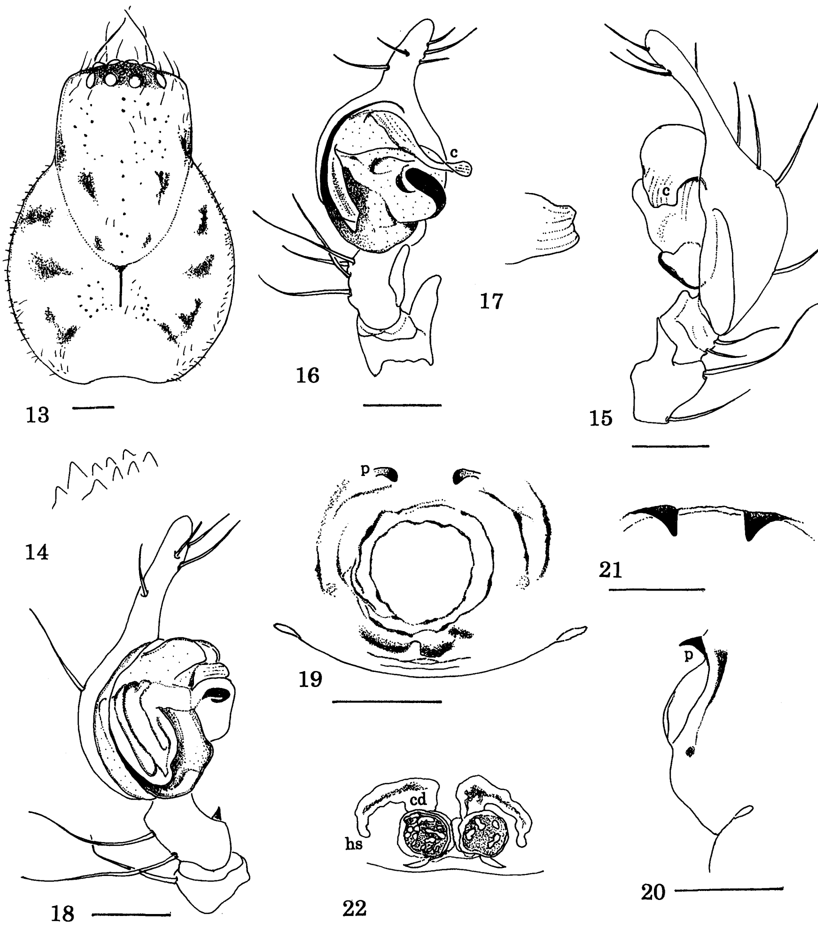
Diagnosis. The species resembles *C. aguniensis* n. sp. but can be distinguished from the latter by the short and small epigynal projections (Figs.19-21); shape of internal genitalia (Fig. 22); shape of distal end of embolic conductor of the male dulated (Fig. 17).

Description. Male holotype: Total length 7.5, carapace 3.8 long, 2.8 wide; sternum shield-shaped, 1.6 long, 1.4 wide; labium wedge-shaped, 0.4 long, 0.5 wide; both cheliceral promargin with 5 teeth, left retromargin with 4; height of clypeus 0.2; cervical groove, median furrow and radial furrows distinct (Fig. 13). AER slightly procurved, PER straight seen from upper; AER slightly procurved, PER strongly procurved from frontal view; order of eye sizes ALE=PLE>PME>AME, interdistances of eyes AME-AME 0.04, AME-ALE 0.04, PME-PME 0.04, ALE-PLE 0.04, PME-PLE 0.12; MOAW>MOAH: Leg I 3.9/1.3/3.7/4.0/2.0/14.9//8(8)/3/9;
Leg II 3.6/1.3/3.0/3.4/1.8/13.1//7(7)/3/8; Leg III 3.3/1.2/2.5/3.4/1.6/12.0//7(7)2/8; Leg IV 4.2/1.3/3.8/4.8/2.0/16.1//7(7)/5/9. Leg formula 4,1,2,3.

Spiniformation of left legs. Dorsal: Fe 1, 4 1-0-1-2-1, 2 1-1-1-2-1, 3 1-1-2-2-1; Pa 1-4 1-0-1; Ti 3, 4 0-1-1; Mt 3 0-1-2, 4 2-2-2. Ventral: Ti 1 2-2-0, 2 2-2-1, 3, 4 2-2-2; Mt 1-4 2-2-2; Ta 4 0-0-1. Prolateral: Ti 3, 4 0-1-1; Mt 3 1-1-1 4 0-1-1. Retrolateral: Pa 1 0-1-0; Ti 2 0-1-1; Mt 1, 4 0-0-1, 2 0-1-1, 3 1-1-0; Ta 0-1-0.

Palp (Figs. 15-18): Patellar apophysis middle sized, pointed from lateral view (Fig. 15), tibial retrolateral apophysis poorly developed; length of embolus normal, filiform; dorsum of embolic conductor concaved (Fig. 16), distal part of conductor from lateral view twist (Fig. 16). Distal end of conductor weakly concave from dorsal view (Figs. 15, 17).

Markings and coloration: Greyish black markings on the carapace apparent as



Figs. 13–22. *Coelotes tonakiensis* n. sp., male holotype (13–18) and female allotype (19–22) ——13, carapace; 14, left cheliceral teeth. 15–18, Left palp: 15, lateral; 16, ventral; 17, distal end of conductor; 18, retrolateral. 19–21, Epigynum: 19, ventral; 20, lateral; 21, projection seen from above. 22, dorsal view of internal genitalia. Scale bars = 0.5 mm.

shown in Fig. 13. Dorsal chevron marks on the opisthosoma poorly developed. From legs I to IV with two dark-colored ring flecks on femora and tibiae, one on each patella.

Female allotype: Total length 7.2, carapace 4,0 long, 2.52 wide; height of clypeus 0.22; both cheliceral promargin with 6 teeth, retromarginal teeth with 5 (right 4). AER and PER same as in holotype: order of eye sizes ALE > PLE > PME > AME; MOAW > MOAH: Leg I 3.0/1.2/2.7/2.7/1.5/11.1//13(13)/4/8; Leg II 2.9/1.2/2.1/2.4/1.3/9.9//13(13)/5/8; Leg III 2.6/1.1/1.8/2.4/1.0/8.9//10(9)/5/6; Leg IV 3.4/1.2/2.9/3.5/1.4/12.4//11(10)/5/8. Leg formula 4 ,1 ,2 ,3.

Spiniformation of left legs. Dorsal: Fe 1, 4 1-0-1-2-1, 2 1-1-1-2-1, 3 1-2-1-2-1; Pa 1, 2, 4 1-0-1, 3 1-1-1; Ti 3, 4 1-0-1; Mt 3 2-1-2, 4 0-2-2. Ventral: Ti 1 2-2-0, 2,

3 2-2-1, 4 2-2-2; Mt 1, 2 2-2-3, 3 2-2-2, 4 2-(1)-1-1; Ta 0-0-1. Prolateral: Ti 3, 4 0-1-1; Mt 2 0-0-1, 3 0-1-1, 4 1-1-1. Retrolateral: Fe 1 0-0-1; Pa 4 0-1-0; Ti 2-4 0-1-1; Mt 2 0-1-1, 3, 4 0-1-1; Ta 0-1-0.

Epigynum and internal genitalia (Figs. 19-22): Atrium shaped kaldera-like, central portion raised (Figs. 19, 20); epigynal projections short, owl beak-shape from lateral view (Fig. 20); spermathecae convoluted, spermathecal stalks apparent, spermathecal head small, spermathecal bases close together (Fig. 22). External shape of carapace, sternum, maxillae, labium, markings and coloration on the body and legs of allotype generally same as in male holotype.

Biology. This species constructs a simple tubular nest at cliffy habitats in the wood, the population density is extremely low.

Distribution. Tonaki-jima, the Ryukyu Islands, Japan.

Coelotes aguniensis n. sp.

[Japanese name: Aguni-yachigumo]

(Figs. 23-33)

Etymology. The specific name is derived from Aguni-jima, an island in the west of southern Okinawa.

Types. Male holotype and female allotype. Aguni-jima, the Okinawa Islands, Okinawa Pref., Japan, 28 November 1982; deposited in NSMT.

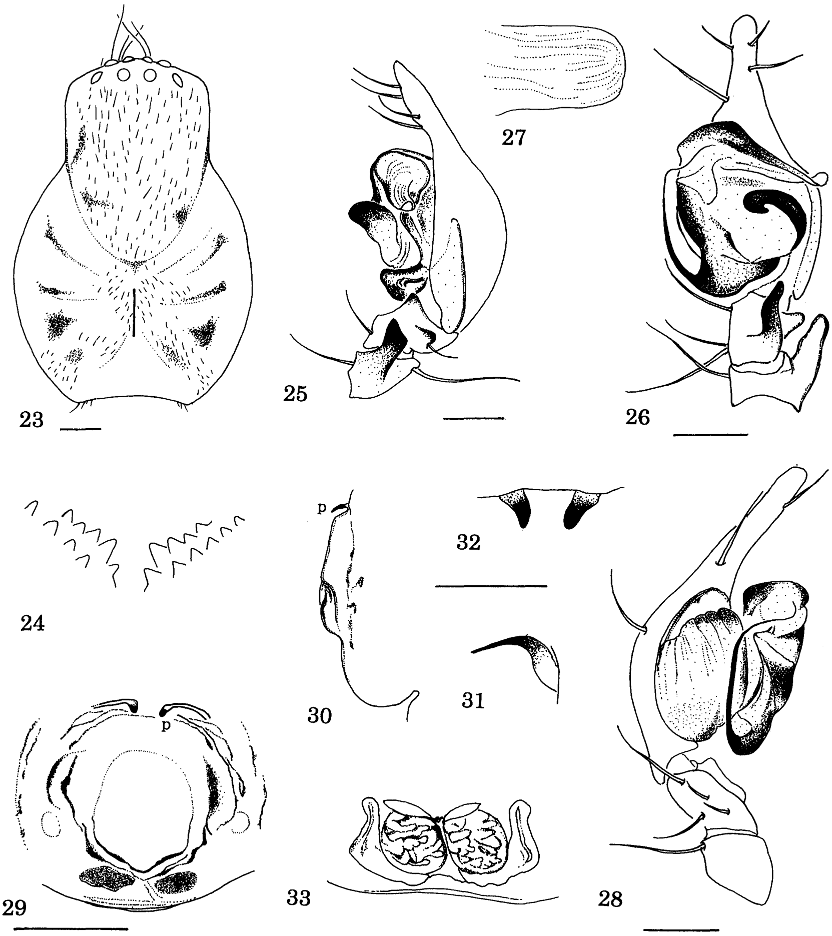
Diagnosis. The ranges of total length of *C. aguniensis* n. sp. are in males 7.1-8.8 ($n=7$, $\bar{x}=7.7\pm10$, SD) females 7.3-8.9 ($n=6$, $\bar{x}=7.9\pm0.7$ SD) middle-sized coelotine spider. The species resembles *C. tonakiensis* n. sp. but can be distinguished from the later by the long hook-shaped of epigynal projections from lateral view (Fig. 31): thumb-shaped of spermathecal stalks toward above from ventral view (Fig. 33): (Figs. 22, 33); shape of the distal end of embolic conductor of male palp not undulated(Fig. 27).

Description. Male holotype : Total length 8.8, carapace 4.3 long, 2.8 wide; sternum shield-shaped 1.8 long, 1.5 wide; labium wedge-shaped, 0.5 long, 0.5 wide; both cheliceral promargin with 5 teeth, left retromargin with 5 (right 4); height of clypeus 0.22; cervical grooves, median furrow and radial furrows apparent (Fig. 23). AER slightly procurved, PER straight seen from upper; AER straight, PER strongly procurved from frontal view; order of eye sizes ALE=PLE>PME>AME, interdistances of eyes AME-AME 0.06, AME-ALE 0.04, PME-PME 0.10, PME-PLE 0.10; MOAW>MOAH: Leg I 4.0/1.4/3.9/4.0/2.1/15.4//8(8)/3/9; Leg II 3.7/1.4/3.0/3.5/1.8/13.4//7(7)/3/9; Leg III 3.2/1.3/2.6/3.5/1.6/12.2//7(7)/4/8; Leg IV 4.4/1.4/3.8/4.7/2.0/16.3//8(8)/4/10. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1, 2, 4 1-0-1-2-1, 3 1-1-2-2-1; Pa 1-4 1- 0-1; Ti 2 1-0-0, 3, 4 1-1-0; Mt 2 0-0-1, 3 1-2-3, 4 2-2-2. Ventral: Ti 1 2-2-0, 2 2-2-1, 3, 4 2-2-2; Mt 1 2-2-3, 2, 3 2-2-2, 4 2-2-1. Prolateral: Pa 3, 4 0-1-0; Ti 3, 4 0-1-1, Mt 3, 4 0-1-1. Retrolateral:Fe 1 0-0-1; Ti 2 0-0-1, 3, 4 0-1-1; Mt 2 0-1-1, 3, 4 1 -1-1; Ta 3 0- 1-0, 4 0-1-1.

Palp (Figs. 25-28): Patellar apophysis middle sized, ax-shaped, pointed (Fig. 25); tibial apophysis long and curved from ventral view (Fig. 26); embolic length middle, filiform (Figs. 26, 28) distal part of conductor twisted (Fig. 26), distal end of conductor slightly rounded from dorsal view, not sclerotized (Fig. 27).

Markings and coloration: Greyish black flecks on the carapace poorly developed (Fig. 23). Dorsum of opisthosoma with three chevron marks, well developed. From



Figs. 23–33. *Coelotes aguniensis* n. sp., male holotype (23–28,) and female allotype (29–33) —— 23, carapace; 24, cheliceral teeth. 25–28, Left palp: 25, lateral; 26, ventral; 27, distal end of conductor; 28, retrolateral. 29–32, Epigynum: 29, ventral; 30, lateral view of epigynum; 31, lateral view of projection; 32, projection seen from above; 33, dorsal view of genitalia. Scale bars = 0.5 mm.

femora to tibiae of each leg with two blackish ring flecks.

Female allotype: Total length 7.7, carapace 4.0 long, 2.8 wide; height of clypeus 0.3; left cheliceral promargin with 5 teeth (right 5+3 small denticles), left retromarginal teeth 5 (right 4).

Shape of sternum, labium and maxillae same as in male holotype, AER and PER same as in holotype; order of eye sizes ALE = PLE > PME > AME; MOAW > MOAH: Leg I 3.4/1.4/3.0/3.0/1.7/12.5//13(13)/3/9; Leg II 3.2/1.2/2.4/2.6/1.5/10.9//13(13)/3/8; Leg III 2.8/1.2/2.0/2.2/1.3/9.5//11(11)/4/8; Fig IV 3.7/1.3/3.2/3.7/1.6/13.5//12(12)/4/8. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1–4 1-0-1-2-1; Pa 1 1-0-0, 2–4 1-0-1; Ti 3,

4 1-0-1; Mt 3 1-1-1, 4 2-2-2. Ventral: Ti 1 2-2-0, 2 1-2-1, 3 2-1-1, 4 2-2-2; Mt 1, 3, 4 2-2-2, 2 2-2-3. Prolateral: Ti 3, 4 0-1-1, Mt 3 0-1-1, 4 1-1-1. Retrolateral: Ti 1, 2 0-0-1, 3 0-1-1, 4 0-1-0. Mt 1 0-0-1, 2, 3 0-1-1, 4 1-1-1; Ta 4 0-1-0.

Epigynum and internal genitalia (Figs. 29-33): Atrium round-shaped, raised, epigynal projections situated at posterioly, short, close together (Figs. 29, 32). Lateral shape of projection hook-like, sharp pointed (Fig. 31), spermathecae convoluted, close together, spermathecal head normal sized (Fig.33). Coloration and markings on the carapace, opisthosoma and legs almost same as in male holotype.

Other materials examined. 1 male, 28 November 1982; Aguni-jima, Aguni-son; 1 male and 6 females, 14 March 1982; Aguni-jima.

Biology. This species lives in bush and limestone caves, it constructs a simple tubular nest under stones, rotten logs or at cliffy places.

Distribution. Aguni-jima, the Ryukyu Islands, Japan.

Coelotes miyakoensis n. sp.

[Japanese name: Miyako-yachigumo]

(Figs. 34-43)

Etymology. Named after the Miyako Islands.

Types. Male holotype and female allotype, Oono-sanrin, Miyako Island, Okinawa pref., Japan, 22 November 1984; deposited in NSMT.

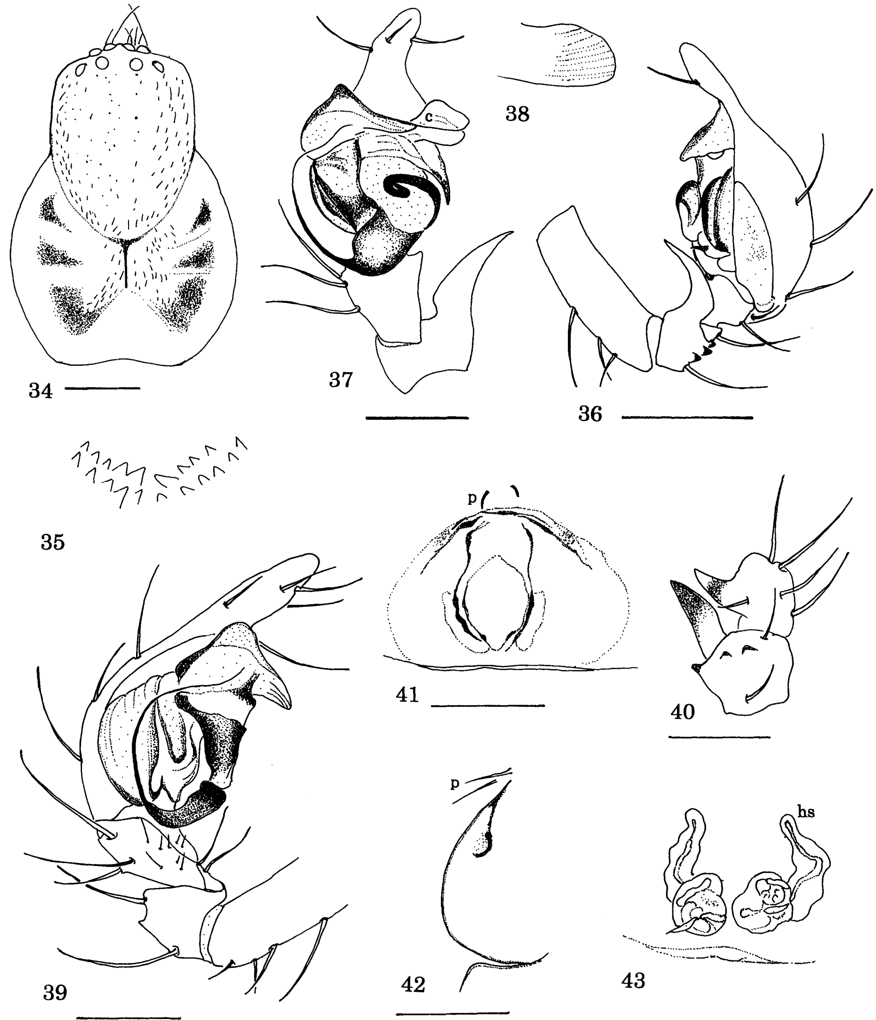
Diagnosis. The ranges of total length are in males 6.7-7.8 ($n=5$, $\bar{x}=7.2\pm0.5$ SD), in females 7.8-9.4 ($n=7$, $\bar{x}=8.5\pm0.6$ SD), middle-sized coelotine spider. This species can be easily distinguished from all other coelotines by its long, pointed tibial apophysis (Figs. 36, 37) and three small tubercles on tibiae of the male palp. (Figs. 36, 40); fin-like shape of the distal end of conductor seen from upper (Fig. 38). Female can be distinguished from the cogeneric species by the needle shape of epigynal projections (Figs. 41, 42) and the shape of spermathecal stalks and spermathecal head, spermathecal bases weakly separated (Fig. 43).

Description. Male holotype. Total length 7.8, carapace 4.2 long, 2.9 wide; sternum shield-shaped, 2.1 long, 1.5 wide; labium 0.4 long, 0.6 wide; height of clypeus 0.3, with some long bristles; left cheliceral promargin with 5 teeth (right 6), left retromarginal teeth 5 (right 4); cervical groove, median furrow and radial furrows apparent (fig. 34). AER strongly procurved, PER slightly procurved seen from upper; AER slightly procurved PER strongly procurved from frontal view; order of eye sizes ALE=PLE=PME>AME; MOAW>MOAH: Leg I 3.5/1.4/3.3/3.6/2.0/13.8//10(10)/3/8; Leg II 3.3/1.3/2.6/3.0/1.6/11.8//10(10)/3/8; Leg III 3.0/1.2/2.2/2.9/1.4/10.7//7(7)/3/5; Leg IV 3.8/1.4/3.2/4.2/1.7/14.3//8(8)/4/8. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1, 2, 4, 1-0-1-2-1, 3 1-1-1-2-1; Pa 1-4 1-0-1; Ti 3 1-0-0, 4 1-0-1; Mt 3, 4 1-2-2. Ventral:Ti 1, 2 2-2-1, 3 2-2-2, 4 1-2-2; Mt 1 2-2-3, 2 3-2-3, 3 2-2-2, 4 2-2-1. Prolateral: Pa 4 0-1-0; Ti 3 1-1-0, 4 0-1-1; Mt 2 0-0-1, 3, 4 1-1-1. Retrolateral: Fe 1 0-0-1; Pa 3 ,4 0-1-0; Ti 2 1-1-1, 3, 4 0-1-1; Mt 2 0-1-3, 3 0-1-1, 4 0-0-1; Ta 3 0-1-0, 4 0-1-1.

Male palp (Figs. 36-40). Patellar apophysis long, sharp pointed and knife-shaped (Figs. 36, 37); dorsal surface of patella with three small tubercles (Figs. 36, 40); tibial apophysis well-developed,pointed from dorsal view (Fig. 40); distal end of embolic conductor wide, fin-like weakly rounded from dorsal view (Fig. 38); length of embolus relatively normal, filiform (Figs. 37, 39).

Markings and coloration: Greyish black flecks on the carapace apparent (Fig. 34).



Figs. 34–43. *Coelotes miyakoensis* n. sp., male holotype (34–40) and female allotype (41–43) —— 34, carapace; 35, cheliceral teeth. 36–40, Left palp: 36, lateral; 37, ventral; 38, distal end of conductor seen from above; 39, retrolateral; 40, dorsal view of patella and tibia. 41–42, Epigynum: 41, ventral; 42, lateral, p-indicate projections; 43, dorsal view of internal genitalia. Scale bars 1mm except for 42 (0.3 mm).

Dorsum of opisthosoma with three grey colored chevron marks; femur and tibia of each leg with two greyish black ring flecks, patella with one.

Female allotype: Total length 9.4, carapace 4.1 long, 2.9 wide; sternum shield shaped, 1.8 long, 1.5 wide; height of clypeus 0.2, with 14 bristles; both cheliceral promargin with 5 teeth, both retromargin with 4; AER and PER same as in male holotype; order of eye sizes ALE=PLE>PME>AME; interdistances of eyes:AME-

AME 0.06, AME-ALE 0.06, PME-PME 0.10, PME-PLE 0.14; MOAW=MOAH: Leg I 3.3/1.2/2.7/2.7/1.8/11.7//13(13)/4/7; Leg II 2.9/1.2/2.1/2.1/1.3/9.6//12(12)/4/7; Leg III 2.7/1.2/1.8/2.4/1.1/9.2//10(10)/4/7; Leg IV 3.6/1.3/2.8/3.4/1.4/12.5//11(10)/4/7. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-2-1-2-0, 2, 3 1-2-1-2-1, 4 1-0-1-2-1; Pa 1, 2, 4 1-0-1, 3 1-1-1; Ti 3 1-0-1, 4 1-1-0; Mt 3 2-2-2, 4 2-2-3. Ventral:Ti 1 2-3-0, 2 2-3-3, 3 2-2-2, 4 3-3-2; Mt 1, 3 2-2-3, 2 2-3-3, 4 2-2-1. Prolateral: Pa 3, 4 0-1-0; Ti 3 1-1-0, 4 1-1-1; Mt 2 0-0-1, 3 0-1-1, 4 1-(1)-1; Ta 4 0-1-0. Retrolateral: Pa 3, 4 0-1-0; Ti 1 0-1-2, 2 1-1-2, 3 0-1-1, 4 1-1-0; Mt 1-3 0-1-1, 4 1-(0)-1-1; Ta 3 0-1-0.

Genitalia (Figs. 41-43). Atrium shield-shaped (Fig. 41), central portion extremely raised from lateral view (Fig. 42); epigynal projections situated anteriorly of atrium (Figs. 41, 42), needle-shaped from lateral view (Fig. 42); spermathecae coiled, spermathecal ducts and spermathecal heads apparent, spermatheca slightly separated (Fig. 43).

Markings and coloration on carapace, opisthosoma and legs of female allotype generally are same as in male holotype.

Other materials examined. 3 males and 3 females, 22 November 1984; Oono-sanrin, Miyako-jima, 1 male and 3 females, 23 November 1984; Abucha-cave, Miyako-jima.

Biology. *Coelotes miyakoensis* n. sp. lives in the Ryukyu limestone caves, in cliffy places, under stones in wood or bush.

Distribution. Miyako-jima and Irabu-jima, The Miyako Islands, Okinawa prefecture, Japan.

Coelotes senkakuensis n. sp.

[Japanese name: Senkaku-yachigumo]

(Figs. 44-49)

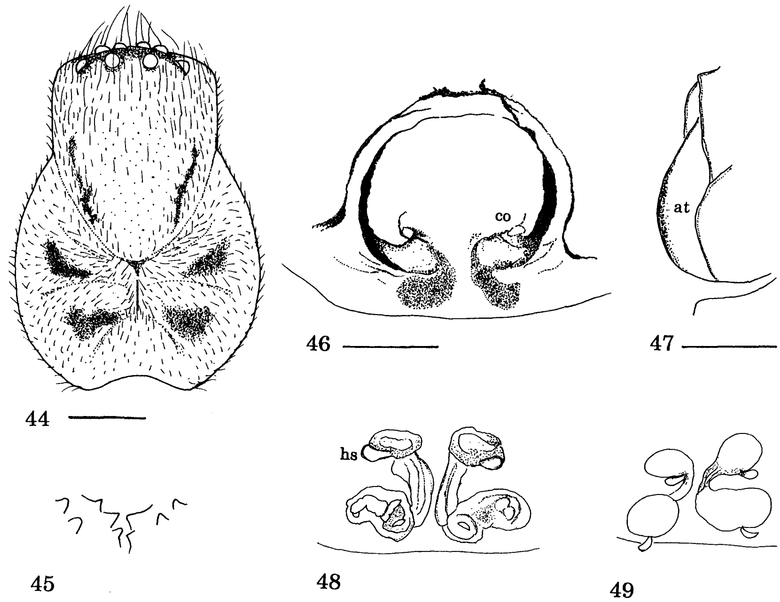
Etymology. Named after the Senkaku Islands, a group of islets in the southeast of Taiwan.

Type. Female holotype, Uotsuri-jima, Senkaku Islands, Okinawa prefecture, Japan, 5 April 1971; deposited in NSMT.

Diagnosis. This new species can be easily distinguished from all other coelotine spiders by lacking epigynal projection, round and raised atrium (Figs. 46-47); apical part of spermathecal stalks expanded, spermathecal head small extremely (Figs. 48, 49). Spermathecal bases large, separated from each other (Figs. 48, 49).

Description. Female holotype: Total length 9.4, carapace 4.5 long, 3.1 wide; sternum shield-shaped, 1.9 long, 1.5 wide; labium wedge-shaped, 0.5 long, 0.6 wide; height of clypeus 0.2; left cheliceral promargin with 2 teeth (right 3), both retromarginal teeth 2 (Fig. 45); cervical groove, median furrow and radial furrows distinct (Fig. 44). AER and PER procurved from dorsal view, AER slightly procurved or straight, PER strongly procurved from frontal view; order of eye sizes ALE=PLE>PME>AME; interdistances of eyes: AME-AME 0.06, AME-ALE 0.04, PME-PME 0.10, PME-PLE 0.10, ALE-PLE 0.06; MOAW>MOAH: Leg I 4.0/1.4/3.6/3.6/2.1/14.7//11(12)/4/6; Leg II 3.6/1.3/2.8/3.2/1.7/12.6//11(11)/4/6; Leg III 3.3/1.2/2.5/3.3/1.6/11.9//11(10)/3/6; Leg IV 4.4/1.4/3.8/5.0/1.9/16.5//10(10)/4/6. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-0-1-2-1, 2, 4 1-1-1-2-1, 3 2-0-2-2-1; Pa 1, 4 0-0-1, 2 0-1-0, 3 1-1-1; Ti 3 1-1-0, 4 1-0-1; Mt 3 1-2-2, 4 2-2-2. Ventral: Ti 1, 2 2-2-1, 3, 4 2-2-2; Mt 1, 3 2-2-2, 2, 4 2-2-1. Prolateral: Fe 1 0-0-1; Pa 3, 4 0-1-0; Ti 3, 4 0-1-1; Mt 1 0-0-1, 2, 4 0-1-1, 3 1-1-1; Ta 3, 4 0-1-0. Retrolateral: Fe 1



Figs. 44–49. *Coelotes senkakuensis* n. sp. female holotype —— 44, carapace; 45, cheliceral teeth. 46–47, Epigynum: 46, ventral; 47, lateral. 48–49, internal genitalia: 48, dorsal view; 49, from slant-above. Scale bars = 0.5 mm except for 44 (1 mm).

0-0-1; Pa 2, 3 0-1-0, 4 0-1-1; Ti 2-4 0-1-1; Mt 1, 4 0-0-1, 2, 3 0-1-1.

Epigynum and internal genitalia (Figs. 46–49): Epigynal projection lacking, atrium round-shaped, raised from lateral view (Figs. 46–47); spermathecae, spermathecal stalks apparent, apical part of spermathecal stalks bulb-shaped, spermathecal head extremely small, spermathecal bases large, separated (Figs. 48–49).

Markings and coloration (in alcohol): Carapace with much yellow or golden hairs, 3 pairs greyish black flecks. Three greyish black chevron marks on the dorsal surface of the opisthosoma, some irregular flecks of same color on lateral sides and ventral surface of the opisthosoma. Femur and tibia of each leg with two incomplete ring flecks.

Male. Unknown.

Biology. *Coelotes senkakuensis* n. sp. was collected by sifting litter of leaves in bush and wood.

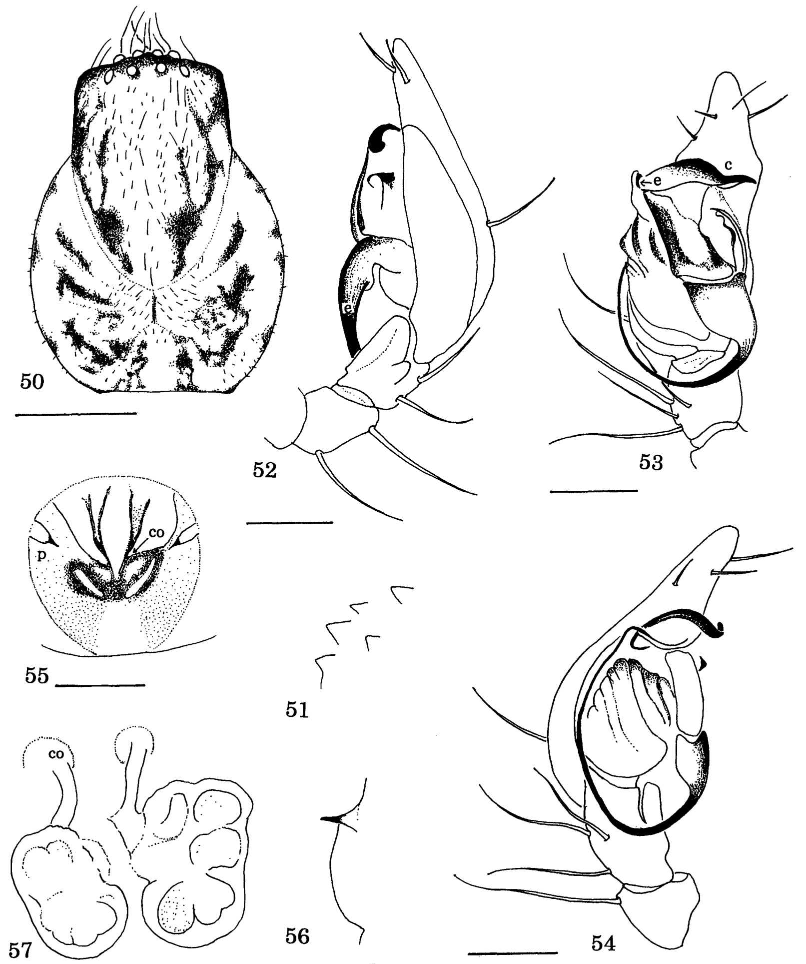
Distribution. Uotsuri-jima and Minami-kojima, the Senkaku Islands, Okinawa prefecture. Japan.

Coelotes motobuensis n. sp.
[Japanese name: Motobu-yachigumo]
(Figs. 50–57)

Etymology. The specific name refers to the Motobu peninsula of Okinawa Island.

Types. Male holotype and female allotype, Mt. Katsu-dake, Motobu peninsula, Okinawa Islands, Japan, 29 November 1998; deposited in NSMT.

Diagnosis. The range of total length of this new species are in males 5.0–5.9 (n=



Figs. 50–57. *Coelotes motobuensis* n. sp., male holotype (50–54) and female allotype (55–57) —— 50, carapace; 51, cheliceral teeth. 52–54, Left palp: 52, lateral; 53, ventral; 54, retrolateral. 55–56, Epigynum: 55, ventral; 56, lateral; 57, dorsal view of internal genitalia. Scale bars = 0.3 mm except for 50 (1 mm).

5, $\bar{x}=5.5\pm0.4$ SD), in females 5.2–7.0 ($n=7$, $\bar{x}=6.0\pm0.8$ SD), small-sized coelotine spider. Cheliceral promargin with 3 teeth and retromargin with 2 teeth on the right and left in male, that of female same as in male, number of marginal teeth invariable in the sexes. This species is very similar to *Coelotes shimajiriensis* n. sp. but can easily be distinguished from the latter by lacking patellar apophysis of male palp, presence of small tibial apophysis of male palp (Fig. 52), a large cymbial furrow (Fig. 52); shape of the epigynum of female description (Figs. 55, 63).

Description. Male holotype. Total length 5.0, carapace 2.7 long, 2.0 wide; sternum shield-shaped, 1.4 long, 1.2 wide, height of clypeus 0.1, with 6 long bristles; cheliceral promargin with 3 teeth, retromargin with 2; cervical groove, median furrow and radial

furrows distinct (Fig. 50). AER slightly procurved , PER straight from dorsal view; AER and PER strongly procurved seen from front; order of eye sizes ALE=PLE=PME>AME; interdistances of eyes AME-AME 0.02, AME-ALE 0.02, PME-PME 0.06, PME-PLE 0.06, ALE-PLE 0.02; MOAW>MOAH: Leg I 2.3/0.8/2.0/2.0/1.2/8.3//12(12)/2/6; Leg II 2.0/0.8/1.5/1.7/1.1/7.1//12(12)/2/6; Leg III 1.8/0.6/1.3/1.5/0.8/6.0//8(8)/2/5; Leg IV 2.4/0.8/2.0/2.4/1.1/8.7//10(10)/2/6. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1, 2, 4 1-0-1-2-0, 3 1-1-0-2-1; Pa 1, 4 0-0-1, 2, 3 1-0-1; Ti 2 1(w)-0-1(w), 3 1-0-0, 4 1-0-1; Mt 2 0-0-1, 3 0-1-1, 4 2-2-2. Ventral: Ti 1, 4 2-2-2, 2 1-2-2, 3 2-1-3; Mt 1 2-2-3, 3 3-2-3, 4 2-2-2; Prolateral: Ti 3 0-2-1, 4 1-1-0; Mt 3, 4 1-1-1. Retrolateral: Fe 1 0-0-1; Pa 2 0-1-1, 4 0-1-0; Ti 2, 3 0-1-1, 4 1-1-0; Mt 2 0-1-1, 3, 4 1-1-1; Ta 3 0-1-2, 4 0-1-0.

Palp (Figs. 52-54): Lacking patellar apophysis, retrolateral apophysis small and blunt (Fig. 54); embolus relatively long, flattened; end of conductor sharp pointed downward(Fig.53); cymbial furrow of male palp large and wide, ridge weakly sclerotized (Fig. 52).

Markings and coloration: Carapace with some irregular greyish black flecks (Fig. 50), opisthosoma dorsally with greyish black flecks, no chevron marks, ventral surface of the opisthosoma with some irregular greyish flecks; both sides of the sternum with 3 pairs dotted greyish brown flecks; femora and tibiae of each leg with two incomplete ring flecks, distal portion of each patella with one.

Female allotype: Total length 5.2, carapace 2.6 long, 1.8 wide; sternum shield shaped, 1.4 long, 1.2 wide; height of clypeus 0.1; chelicera with 3 promarginal and 2 retromarginal teeth; AER and PER seen from above or front same as in male holotype; order of eye sizes ALE=PLE=PME>AME; interdistances of eyes: AME-AME 0.04, AME-ALE 0.04, PME-PME 0.04, PME-PLE 0.08, ALE-PLE 0.04; MOAW>MOAH: Leg I 2.0/0.8/1.6/1.6/1.0/7.0//15(15)/4/5; Leg II. 8/0.8/1.2/1.4/0.8/6.0//14(14)/4/5; Leg III 1.6/0.7/1.0/1.4/0.7/5.4//10(10)/3/4; Leg IV 2.1/0.9/1.7/2.0/0.8/7.4//11(11)/4/5. Leg formula 4, 1, 2, 3.

Spiniformation of left legs: Dorsal: Fe 1 1-0-1-1-0, 2, 4 1-0-1-2-0, 3 1-2-1-2-0; Pa 1, 4 0-0-1(w), 2, 3 1(w)-0-1(w); Ti 2 1(w)-0-0, 3 0-1-0, 4 1-1-0; Mt 2 0-0-1, 3 2-2-2, 4 0-2-2. Ventral: Ti 1 2-2-1, 2, 3 1-2-2, 4 2-2-2; Mt 1, 2 2-2-3, 3, 4 2-2-2. Prolateral: Pa 3 0-1-0, Ti 3, 4 0-1-1; Mt 3 0-1-1, 4 1-1-1. Retrolateral: Fe 1 0-0-1; Pa 4 0-1-0; Ti 2 0-1-0, 3, 4 0-1-1; Mt 2, 3 0-1-1, 4 1-1-1; Ta 3, 4 0-1-0.

Genitalia (Figs. 55-57): Epigynal projections short, pointed, situated at middle of the atrium, widely separated from each other (Fig. 55); spermathecae visible through the thin cuticle of the atrium (Fig. 55); spermathecae convoluted, spermathecal bases large, weakly separated (Fig. 57).

Markings and coloration of allotype generally same as those of male holotype.

Other materials examined. 4 males, 13 February 1982; Mt. Katsu-dake, Motobu Peninsula, Okinawa Island, 2 females, 25 March 1971; Mt.Katsu-dake; 4 females, 24 November 1983; Mt. Katsu-dake.

Biology. This new species lives under stones or in the litter of leaves in wood, it constructs a simple small tubular nest under stones or decaying leaves.

Distribution. Okinawa Island (restricted to northern area).

Coelotes shimajiriensis n. sp.
[Japanese name: Shimajiri-yachigumo]
(Figs. 58–65)

Etymology. Named after Shimajiri, southern district of Okinawa Island.

Types. Male holotype and female allotype, Tamagusuku-son, Shimajiri district, Okinawa prefecture, Japan, 19 January 1984, deposited in NSMT.

Diagnosis. The ranges of total length of *C. simajiriensis* n. sp. are in males 3.8–5.4 ($n=6$, $\bar{x}=4.8\pm0.5$ SD), in females 4.9–5.0($n=3$, $\bar{x}=4.9\pm0.1$ SD), small-sized coelotine spider. Number and arrangements of marginal teeth on the right and left chelicerae of both sexes completely same as in *Coelotes motobuensis* n. sp. External feature and coloration is very similar to *Coelotes motobuensis* n. sp. but easily distinguished from the latter by the long, stout patellar apophysis of the male palp (Figs. 52, 60); shape of the epigynum in female description (Figs. 55, 63).

Description. Male holotype: Total length 5.1, carapace 2.6 long, 1.8 wide; sternum shield-shaped, 1.4 long, 1.1 wide; height of clypeus 0.2, with some long bristles; both cheliceral promargins with 3 teeth, both retromargin with 2 teeth; cervical groove, median furrow and radial furrows apparent (Fig. 58). AER strongly procurved, PER slightly procurved when seen from upper; AER slightly procurved, PER strongly procurved in frontal view; order of eyes sizes ALE = PLE = PME > AME; interdistances of eyes AME-AME 0.02, AME-ALE 0.02, PME-PME 0.04, PME-PLE 0.04,ALE-PLE 0.02; MOAW > MOAH: Leg I 2.1/0.8/1.8/1.9/1.2/7.8//11(11)/3/7; Leg II 1.8/0.8/1.3/1.6/1.0/6.5//10(10)/3/6; Leg III 1.6/0.7/1.1/1.6/0.8/5.8//8(8)/3/5; Leg IV 2.2/0.8/1.8/2.3/1.0/8.1//10(10)/3/5. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-0-1-1-0, 2-4 1-0-1-2-0; Pa 1 0-0-1(w), 2-4 1(w)-0-1(w), 3, 4 1-0-1; Ti 1, 2, 4 1(w)-0-0, 3 1-1-0; Mt 3 0-2-2, 4 2-2-2. Ventral: Ti 1, 3, 4 2-2-2, 2 1-2-2; Mt 1, 3, 4 2-2-2. Prolateral: Pa 3 0-1-0; Ti 3, 4 0-1-1; Mt 3, 4 1-1-1. Retrolateral: Fe 1 0-0-1; Pa 3 0-1-(w)-0, 4 0-1-0; Ti 2-4 0-1-1; Mt 1 0-0-1, 2 1-0-1, 3 0-1-1, 4 1-1-1; Ta 3 0-1-0, 4 0-1-1.

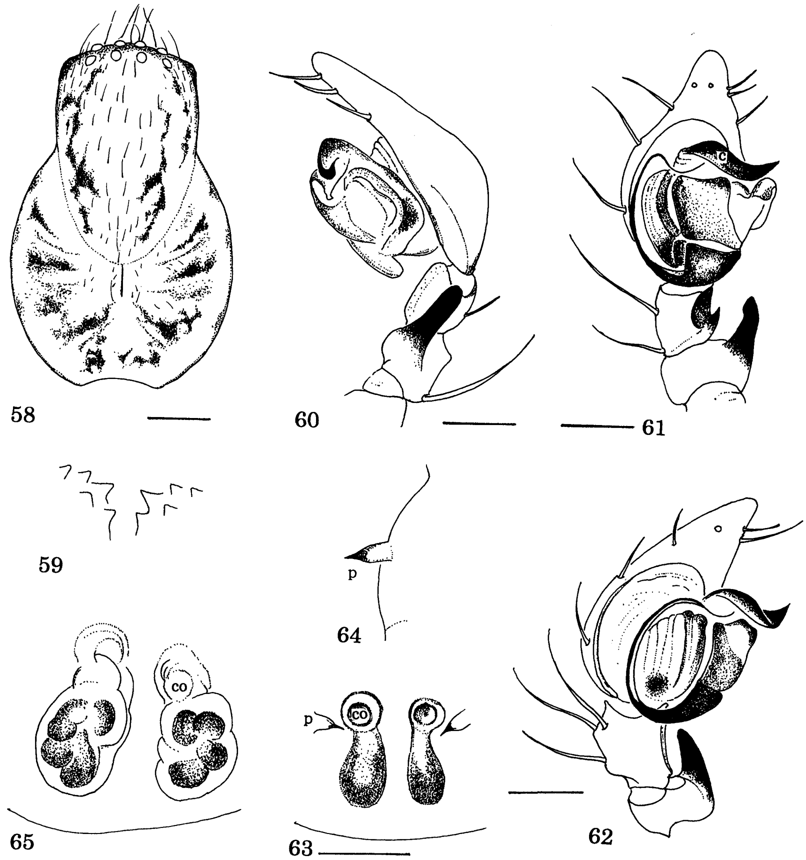
Palp (Figs. 60–62): Patellar apophysis long and stout, pointed (Figs. 61–62); lateral cymbial furrow narrow (Fig. 60); embolic length normal, thick and flattend (Figs. 61, 62).

Markings and coloration (in alcohol): Carapace with irregular greyish black flecks (Fig. 58); dorsal surface of the opisthosoma with much dark grey flecks; femora and tibiae of each leg with two incomplete ring flecks; distal end of patella with dark grey ring flecks.

Female allotype: Total length 4.9, carapace 2.4 long, 1.5 wide; number of marginal teeth of chelicerae and each eye row are same as in male holotype; order of eye size PME > PLE = ALE > AME; interdistances of eyes: AME-AME 0.06, AME-ALE 0.02, PME-PME 0.06, PME-PLE 0.04, ALE-PLE 0.02; MOAW > MOAH: Leg I 1.8/0.8/1.5/1.5/1.0/6.6//15(15)/3/5; Leg II 1.6/0.7/1.1/1.2/0.8/5.4//15(15)/3/5; Leg III 1.4/0.6/1.0/1.2/0.7/4.9//10(10)/3/5; Leg IV 1.9/0.7/1.5/1.6/0.8/6.5//12(12)/4/5. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1, 2 1-0-1-1-0, 3 1-1-1-2-0, 4 1-0-1-2-0; Pa 1 0-0-1(w), 2, 4 1-0-1; Ti 2 1(w)-0-0, 3 0-1-0, 4 1(w)-1(w)-0; Mt 3 1-1-1, 4 0-1-2. Ventral: Ti 1 2-2-0, 2 1-1-2, 3, 4 1-2-2; Mt 1, 3, 4 2-2-3, 2 2-2-2. Prolateral: Pa 3 0-1-0; Ti 3 1-1-0, 4 0-1-1; Mt 3, 4 1-1-1. Retrolateral: Fe 1 0-0-1; Pa 4 0-1-0; Ti 2, 4 0-1-1, 3 1-1-0; Mt 2 0-1-1, 3, 4 1-1-1; Ta 3 0-1-0.

Genitalia (Figs. 63–65). Epigynal projections short, pointed, situated at middle of



Figs. 58–65. *Coelotes shimajiriensis* n. sp., male holotype (58–62) and female allotype (63–65) —— 58, carapace; 59, cheliceral teeth. 60–62, Left palp: 60, lateral; 61, ventral; 62. retrolateral. 63–64, Epigynum: 63, ventral; 64, lateral; 65, dorsal view of internal genitalia. Scale bar = 0.3 mm

atrium, protruding(Fig. 64); spermathecae large, bulb-shaped, spermathecal bases large, separated from each other (Fig. 65). External feature of the body, marking and coloration of female allotype are almost same as in male holotype.

Other materials examined. 5 males and 1 female, 19 January 1984; Tamagusuku-son, Shimajiri district, Okinawa-jima; 1 male, 8 January 1985; Yokuta; 1 male, 8 December 1985; Yokuta Yomitan-son, Okinawa,

Biology. Habitats of *Coelotes shimajiriensis* n. sp. are almost same as those of *Coelotes motobuensis* n. sp., but the population density of the former is extremely low.

Distribution. From Yomitan to Shimajiri district in Okinawa Island.

Coelotes iheyaensis n. sp.

[Japanese name: Iheya-yachigumo]

(Figs. 66–74)

Etymology. The specific name is derived from Iheya-jima, an islet in the northwest

of Okinawa Island.

Types. Male holotype and female allotype, Mt. Gayo-san, Iheya-jima, Okinawa Prefecture, Japan, 20 October 1983; deposited in NSMT.

Diagnosis. The range of total length of *C. iheyaensis* n. sp. is in males 6.4–7.5(n=4, $\bar{x}=6.9\pm0.4$ SD), in females 6.5–7.5 (n=3, $\bar{x}=6.8\pm0.4$ SD); middle-sized coelotine spider. Number and arrangements of marginal teeth of chelicerae in both sexes generally same as those in *C. motobuensis* n. sp. and *C. shimajiriensis* n. sp.. This species can easily be distinguished from all other cogeneric species by the unique shape of the spiral embolic conductor, thick and very long embolus of male palp (Figs. 68–70); epigynum of spectacles shape (Fig. 71); shape of spiral spermathecae, copulatory ducts and small spermathecal head (Fig. 74).

Description. Male holotype: Total length 7.5, carapace 4.0 long, 2.5 wide; sternum shield-shaped, 2.1 long, 1.7 wide; labium wedge-shaped, 0.6 long, 0.6 wide; height of clypeus 0.2, with long 9 bristles; cheliceral promargin with 3 teeth, retromargin with 2; fangs of chelicerae strongly curved; cervical groove, median furrow and radial furrows apparent, lateral sides of thoracic region undulated (Fig. 66); AER procurved, PER slightly procurved seen from upper; AER straight or slightly procurved, PER slightly procurved in frontal view; order of eyes sizes ALE=PLE>PME>AME; interdistances of eyes: AME-AME 0.04, AME-ALE 0.06, PME-PME0.08, PME-PLE 0.24, ALE-PLE 0.02; MOAW>MOAH. Leg I 2.8/1.0/2.2/2.3/1.4/9.7//11(12)/3/7; Leg II 2.6/1.0/2.0/2.2/1.2/9.0//11(12)/3/6; Leg III 2.4/1.1/1.7/2.4/1.2/8.8//9(10)/3/6; Leg IV 3.3/1.3/2.6/3.3/1.5/11.9//13(12)/4/8. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-0-1-1-0, 2 1-0-0-0-0, 3 1-1-1-2-1, 4 1-0-1-2-1; Pa 1(w)-0-0, 2 1(w)-0-1(w), 3, 4 0-0-1; Ti 2 1(w)-0-0, 3 1-1-0, 4 1(w)-1-1(w); Mt 3 1-2-2, 4 1-1-2. Ventral: Ti 1 2-(2)-2-2, 2 0-(1)-1-0, 3, 4 2-2-2; Mt 1 0-(1)-2-(2)-1, 2 0-(1)-2-(1)-1, 3, 4 2-2-2; Ta 3 0-1(w)-1(w), 4 0-1-1. Prolateral: Pa 3, 4 0-1-0, Ti 3 1-1-0, 4 0-1-1; Mt 3, 4 1-1-1; Ta 3 0-1-0, 4 0-1-1. Retrolateral: Fe 1 0-0-2(+1); Pa 3, 4 0-1-0; Ti 1 0-1-2, 2 0-0-2, 3, 4 0-1-1; Mt 2 0-1(w)-0, 3, 4 1-1-1; Ta 3 0-1-0, 4 0-1-1.

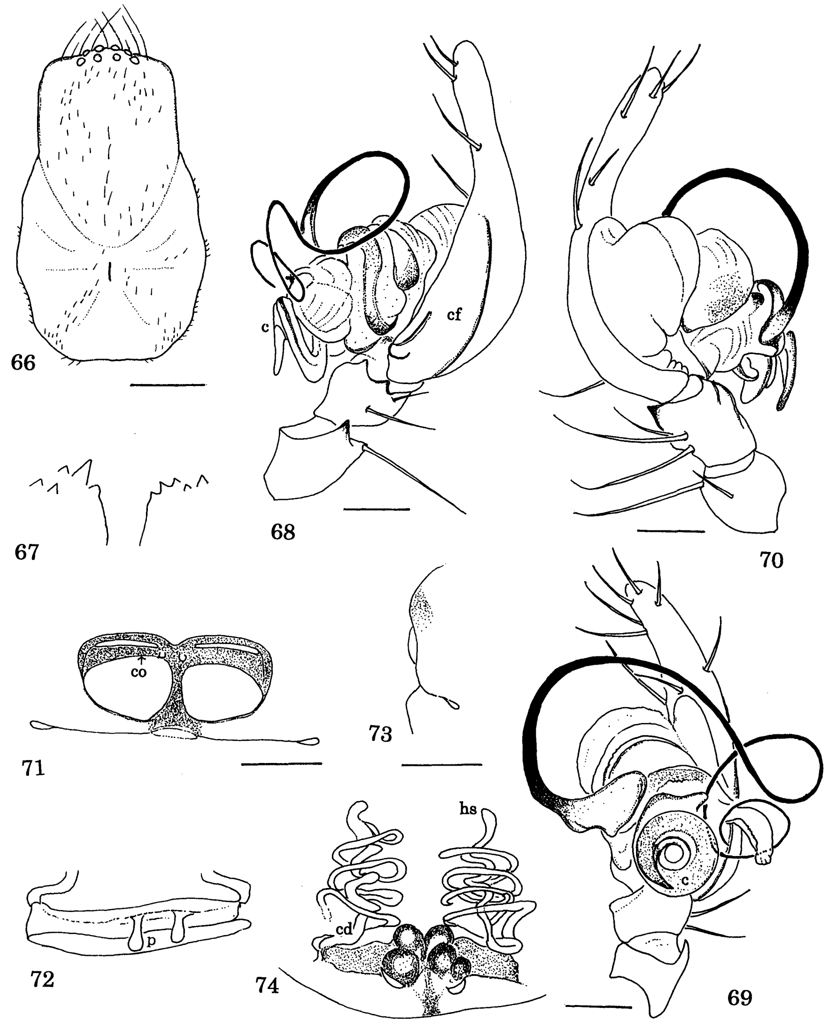
Palp (Figs. 68, 70): Patellar and tibial apophysis small, pointed in lateral view (Fig. 68); spiral-shaped conductor, whip-like embolus, very long embolus, c-shaped in cross section (Figs. 68, 69), lateral cymbial furrow large and deep (Fig. 68).

Markings and coloration: No flecks on the carapace; opisthosoma dorsally with 3 weak chevron marks, ventral surface of the opisthosoma without flecks; median furrow reddish brown; lack ring flecks on each leg.

Female allotype: Total length 7.2, carapace 3.8 long, 2.4 wide; sternum shield-shaped, 2.0 long, 1.5 wide; promarginal teeth of both chelicerae with 3, both retromargin with 2 teeth; AER and PER alike to male holotype; order of eye size ALE=PLE>PME>AME; interdistances of eyes: AME-AME 0.04, AME-ALE 0.06, PME-PME 0.10, PME-PLE 0.14, ALE-PLE 0.04; MOAW>MOAH: Leg I 2.6/1.2/2.0/2.0/1.1/8.9//14(14)/3/7; Leg II 2.4/1.1/1.6/1.8/1.0/7.9//12(12)/3/7; Leg III 2.0/1.1/1.3/1.9/1.0/7.3//11(10)/4/6; Leg IV 2.9/1.3/2.3/2.8/1.2/10.5//12(10)/4/7. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-0-1-1-0, 2 1-0-1-1-1(w), 3 1-2-1-2-1, 4 1-0-1-2-1; Pa 1-3 1(w)-0-1(w), 4 1-0-1; Ti 3 1-(1)-0-0,4 1-(1)-0-1(w); Mt 3, 4 1-1-2. Ventral: Ti 1, 3, 4 2-2-2, 2 1-2-2; Mt 1, 2 2-2-1, 3 2-2-2, 4 2-2-3; Ta 3, 4 0-1-0. Prolateral: Pa 3, 4 0-1-0; Ti 3, 4 0-1-1; Mt 3, 4 1-1-1; Ta 3, 4 0-1-0. Retrolateral: Fe 1 0-0-1, 2 0-0-1(w); Pa 3, 4 0-1-0; Ti 2-4 0-1-1; Mt 1 0-1-1, 2 1-0-1, 3, 4 1-1-1; Ta 3 0-1-0, 4 0-1-1.

Genitalia (Figs. 71–74). Epigynum spectacles shaped from ventral view (Fig. 71);



Figs. 66–74. *Coelotes iheyaensis* n. sp., male holotype (66–70) and female allotype (71–74) —— 66, carapace; 67, cheliceral teeth. 68–70, Left palp: 68, lateral; 69, ventral; 70, retrolateral. 71–73, Epigynum: 71, ventral; 72, obliquely from below; 73, lateral; 74, dorsal view of internal genitalia. Scale bars = 0.3mm,

epigynal projections very small, less developed (Figs. 71, 72); spermathecae coiled, spermathecal head normal, copulatory ducts spiraled; spermathecal bases close together (Fig. 74).

Other materials examined. 3 males and 1 female, 19 October 1983; Mt. Gayo-san, Iheya-jima, Okinawa Islands; 1 female, 20 October 1984; Mt. Gayo-san, Iheya-jima,

Biology. Unknown. The specimens were collected from cliffy place in the wood.

Distribution. Iheya-jima, Okinawa Islands.

Coelotes yambaruensis n. sp.
[Japanese name: Yambaru-yachigumo]
(Figs. 75–83)

Etymology. Named after Yambaru, common geographic name for the northern area of Okinawa Island.

Types. Male holotype and female allotype, Mt. Nishime, Kunigami district (Yambaru) of Okinawa Island, Japan, 7 November 1999; deposited in NSMT.

Diagnosis. The range of total length of this new species is in males 9.4–10.3 ($n=4$, $\bar{x}=9.7\pm0.4$ SD), in females 8.9–11.2 ($n=3$, $\bar{x}=10.2\pm1.2$ SD); large-sized coelotine spider. Chelicerae marginally with 3 teeth in males and females. This species is similar to *C. izenaensis* n. sp. but can be distinguished by the shape of retrolateral tibial apophysis (Figs. 77, 86), shape of distal end of conductor (Figs. 79, 88) of male palpal organ; shape of epigynum and internal genitalia of female (Figs.83,92).

Description. Male holotype: Total length 9.8, carapace 5.2 long, 3.9 wide; sternum shield-shaped, 2.6 long, 2.1 wide; labium wedge-shaped, 0.7 long, 0.6 wide; Chelicerae with 3 marginal teeth (Fig. 76); cervical groove, median furrow and radial furrows distinct (Fig. 75). AER slightly procurved, PER strongly recurved as seen from upper; AER slightly procurved, PER strongly procurved in frontal view; order of eye size ALE>PLE>AME=PME; interdistances of eyes AME-AME 0.04, AME-ALE 0.02, PME-PME 0.16, PME-PLE 0.22, ALE-PLE 0.02; MOAW>MOAH: Leg I 5.2/1.9/5.0/5.5/2.7/20.3//13(13)/3/8; Leg II 4.9/1.8/4.1/4.8/2.3/17.9//13(13)/3/8; Leg III 4.4/1.7/3.4/4.6/2.1/16.2//10(10)/3/8; Leg IV 5.4/1.7/4.8/6.0/2.5/20.4//10(10)/3/9. Leg formula 4, 1, 2, 3.

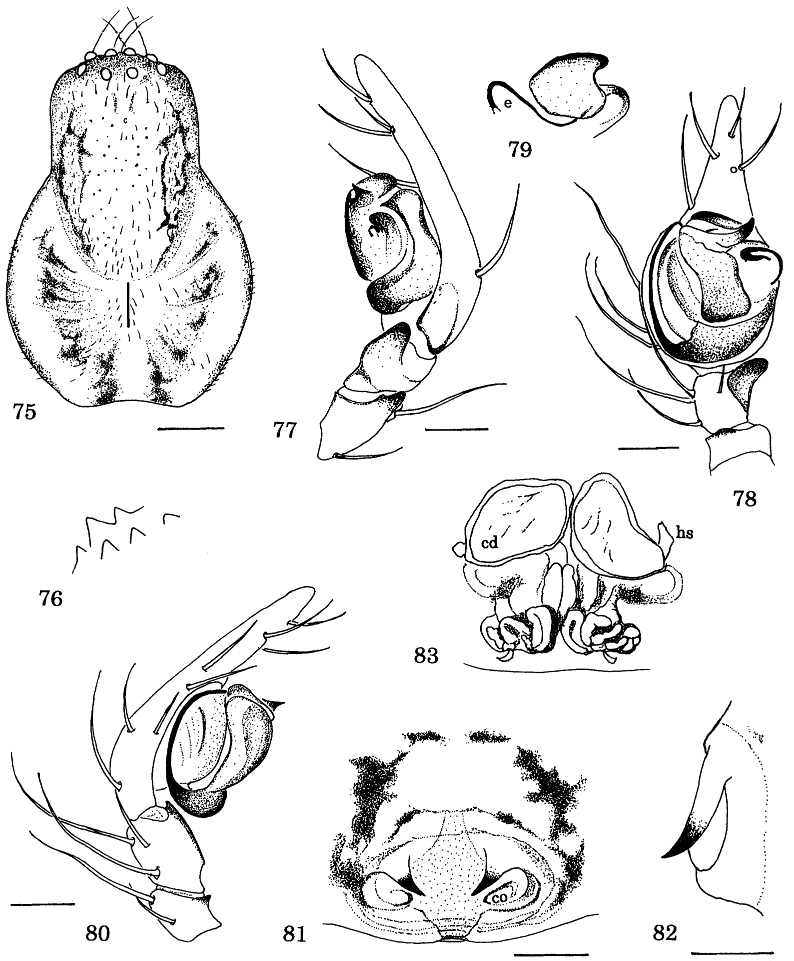
Spiniformation of left legs. Dorsal: Fe 1 1-0-1-2-1, 2 1-1-1-2-1, 3, 4 1-1-0-2-1; Pa 1–4 1-0-1; Ti 2 1-0-0, 3 1-0-1, 4 1-1-0; Mt 2 0-0-1, 3 1-0-1, 4 1-2-2. Ventral: Ti 1, 3, 4 2-2-2, 2 2-2-1; Mt 1–3 2-2-3, 4 2-1-(2)-2. Prolateral:Pa 3, 4 0-1-0; Ti 3 1-1-0, 4 0-1-1; Mt 3 1-2-2, 4 1-1-1; Ta 4 0-1-0. Retrolateral: Fe 1, 3 0-1-0, 2 0-1-1; Pa 1–4 0-1-0; Ti 1 1-0-0, 2, 4 0-1-1, 3 1-1-0; Mt 2, 3 0-1-1, 4 0-0-1; Ta 3, 4 0-1-0.

Palp (Figs. 77–80): Patellar and tibial apophysis in lateral view middle sized (Fig. 77). Distal end of conductor in ventral view curved for upper side (Fig. 78); middle portion of the conductor as seen from upper heart-shaped, marginal ridges of it sclerotized, well developed (Fig. 79). No flecks on the carapace, dorsum of opisthosoma with 4 dotted whitish gray marks; ventral surface of the opisthosoma with many, small gray dot-marks. Femur and tibia of each leg with 2 incomplete ring marks.

Female allotype. Total length 11.16, carapace 5.5 long, 3.4 wide; sternum 2.5 long, 2.2 wide; morphological feature except for palpi generally alike to male holotype; number of marginal teeth is entirely same as in male. Leg I 4.6/1.8/4.0/4.1/2.2/16.7//12(12)/2/9; Leg II 4.1/1.8/3.2/3.7/1.9/14.7//12(12)/2/8; Leg III 3.9/1.6/2.8/3.6/1.6/13.5//9(9)/2/8; Leg IV 4.8/1.9/4.1/5.0/2.0/17.8//10(10)/2/8. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-0-1-2-1, 2, 4 1-1-1-2-1, 3 1-2-1-2-1; Pa 1–4 1-0-1; Ti 3, 4 1-1-0; Mt 3 0-1-2, 4 2-2-2. Ventral: Ti 1, 3, 4 2-2-2, 2 2-2-1; Mt 1, 2 2-2-3, 3, 4 2-(1)-2-3. Prolateral: Pa 3, 4 0-1-0; Ti 3, 4 0-1-1; Mt 3, 4 1-1-1; Ta 4 0-0-1. Retrolateral: Fe 1–4 0-1-0; Pa 2 0-1-0, 3, 4 0-1-0; Ti 2–4 0-1-1; Mt 2 0-1-1, 3 1-1-1, 4 0-0-1; Ta 3 0-1-0, 4 0-1-1.

Epigynum and internal genitalia (Figs. 81–83): Epigynal projections stout, long and pointed; copulatoy opening apparent, situated at lower side of projections (Fig. 81, 82). Copulatory ducts broad, membranous; spermathecal head small, nipple-shaped, spermathecae convoluted, spermathecal bases separated (Fig. 83).



Figs. 75–83. *Coelotes yambaruensis* n. sp., male holotype (75–80) and female allotype (81–83) —— 75, carapace; 76, left cheliceral teeth. 77–80, Left palp: 77, lateral; 78, ventral; 79, distal portion of conductor seen from above; 80, retrolateral. 81–82. Epigynum: 81, ventral; 82, lateral, 83, dorsal view of internal genitalia. Scale bars = 0. 5 mm except for 82 (0.3 mm).

Markings and coloration: In general, marks on the dorsal surface of the body and ring fleck on each leg of allotype closely resemble to those in male holotype.

Other materials examined. 1 male and 1 female, 6 November 1999; Mt. Nishime-dake, Kunigami district (Yambaru), Okinawa Island, 2 males and 1 female, 7 November 1999; same locality as the male holotype.

Biology. This new species spins a tubular nest with sheet web in decaying logs or the litter of leaves in the forest. Life cycle unknown; population density low.

Distribution. This new species is distributed in a rather restricted area in the Yambaru region of the nothern part of Okinawa Island.

Coelotes izenaensis n. sp.
[Japanese name: Izena-yachigumo]
(Figs. 84–93)

Etymology. The specific name is derived from Izena-jima, an islet in the northwest of Okinawa Island.

Types. Male holotype and female allotype, Izena Island, Okinawa prefecture, Japan, 16 November 1997; deposited in NSMT.

Diagnosis. The range of total length of *C. izenaensis* n. sp. is in males 9.79–11.66 (n=6, $\bar{x}=10.9\pm0.7$ SD), in females 8.7–12.0 (n=5, $\bar{x}=10.2\pm1.3$ SD), large-sized coelotine spider. Number and arrangements of marginal teeth of chelicerae in both sexes entirely same as in *C. yambaruensis* n. sp. This species closely resembles *Coelotes yambaruensis* n. sp. but it can be distinguished by the shape of the tibial apophysis (Figs. 77, 86) and the shape of the distal end of the conductor of the male palp (Figs. 78–79, 87–88); the shape of epigynal projections (Figs. 81, 82, 90, 91) and internal genitalia such as spermathecae and spermathecal head of the female (Figs. 83, 92).

Description. Male holotype: Total length 11.0, carapace 6.1 long, 4.0 wide; sternum shield-shaped, 2.9 long, 2.2 wide; labium wedge shaped, 0.8 long, 0.7 wide; height of clypeus 0.2, with twelve long bristles; cheliceral margin with 3 teeth (Fig. 85); cervical groove and median furrow apparent, posterior groove of radial furrows indistinct (Fig. 84); AER slightly procurved, PER slightly recurved seen from upper; AER slightly procurved, PER strongly procurved; order of eye sizes ALE>PLE>AME=PME; interdistances of eyes: AME-AME 0.10, AME-ALE 0.04, PME-PME 0.16, PME-ALE 0.24, ALE-PLE 0.24; MOAW>MOAH: Leg I 5,4/1.9/4.9/5.3/2.8/20.3//14(14)/2/9; Leg II 5.1/1.8/4.0/4.8/2.3/18.0//14(14)/2/9; Leg III 4.8/1.9/3.7/4.7/2.2/17.3//13(12)/2/8; Leg IV 5.9/2.0/5.1/6.4/2.6/22.0//11(11)/2/9. Leg formula 4, 1, 2, 3.

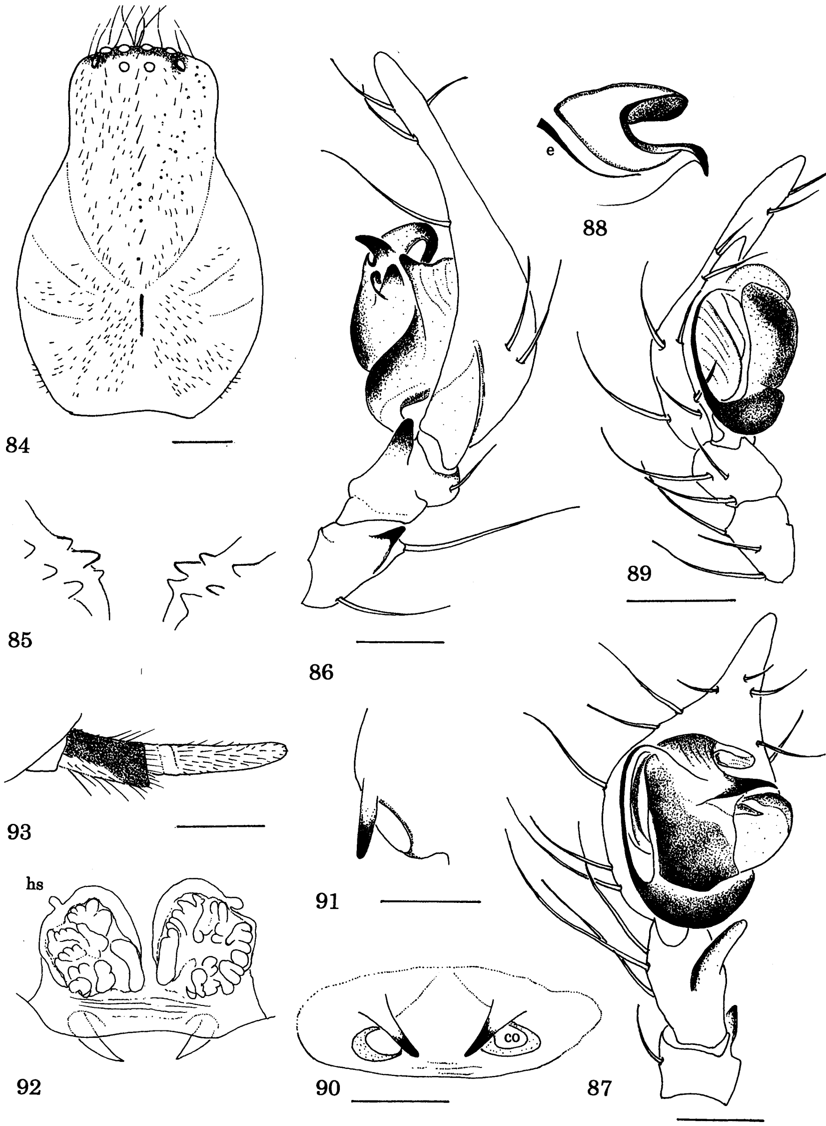
Spiniformation of left legs. Dorsal: Fe 1 1-0-1-2-1, 2, 3 1-2-1-2-1, 4 1-1-1-2-1; Pa 1-4 1-0-1; Ti 2 1-0-0, 3 1-0-1, 4 1-1-0; Mt 2, 3 1-0-1, 4 2-2-2. Ventral: Ti 1-4 2-2-2; Mt 1-3 2-2-3, 4 2-2-(2)-3. Prolateral: Pa 3, 4 0-1-0; Ti 3 1-1-0, 4 0-1-1; Mt 3 1-2-2, 4 0-0-1; Ta 4 0-0-1. Retrolateral: Fe 1-4 0-1-0; Pa 1-4 0-1-0; Ti 1 1-0-0, 2 0-0-1, 3, 4 0-1-1; Mt 2,·3 0-1-1, 4 0-0-1; Ta 3 0-1-0, 4 0-1-1.

Palp (Figs. 86–89): Patellar apophysis relatively short, pointed in lateral view (Fig. 86); retrolateral tibial apophysis long, stout, well developed (Figs. 86–87); embolus normal filiform (Figs. 87, 89); middle portion of the conductor hood-like shaped as seen from upper, the edge of it weakly sclerotized, distal end of conductor a sharp point (Fig. 88); lateral cymbial furrow of palp short and wide (Fig. 86).

Markings and coloration: Carapace without any marks; chevron marks on the dorsum of opisthosoma; a few small flecks on ventral surface of opisthosoma; dorsal surface of posterior basal segments of the spinnerets blackish grey (Fig. 93); from femur to tibia of each leg with incomplete ring flecks.

Female allotype: Total length 10.5, carapace 5.7 long, 3.8 wide; sternum 2.6 long, 2.2 wide; length and width of labium 0.7; height of clypeus 0.3; both chelicerae with 3 marginal teeth (Fig.85); eye rows entirely same as in male holotype; order of eye sizes ALE>PLE=AME=PME; interdistances of eyes: AME-AME 0.10, AME-ALE 0.04, PME-PME 0.14, PME-PLE 0.20, ALE-PLE 0.20; MOAH>MOAW: Leg I 4.4/1.7/3.7/3.9/2.0/15.7//12(13)/4/8; Leg II 4.0/1.7/3.0/3.4/1.6/13.7//12(13)/4/8; Leg III 3.8/1.5/2.6/3.4/1.6/12.9//10(11)/2/8; Leg IV 4.7/1.7/3.9/4.8/1.9/17.0//11(11)/3/8. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1 1-0-1-2-1, 2, 3 1-2-1-2-1, 4 1-1-1-2-1;



Figs. 84–93. *Coelotes izenaensis* n. sp., male holotype (84–89, 93) and female allotype (90–92) —— 84, carapace; 85, cheliceral teeth. 86–89, Left palp: 86, lateral; 87, ventral; 88, conductor seen from above, ec-indicates an embolus; 89, retrolateral. 90–91, Epigynum: 90, ventral view; co-indicates a copulatory opening; 91, lateral. 92, dorsal view of internal genitalia. 93, lateral view of posterior spinneret. Scale bars 0.5 mm, except for that in 84 (=1 mm).

Pa 1–4 1–0–1; Ti 2 1–0–0, 3, 4 1–1–0; Mt 2 0–0–1, 3 0–1–2, 4 2–2–2. Ventral: Ti 1, 2 2–2–1, 3, 4 2–2–2, Mt 1–3 2–2–3, 4 2–1–2–3. Prolateral: Pa 3, 4 0–1–0; Ti 3 0–0–1, 4 0–1–1; Mt 3, 4 1–1–1, Ta 4 0–0–1. Retrolateral: Pa 2–4 0–1–0, Ti 2, 4 0–1–1; Mt 2 0–

1-1, 3 1-1-1, 4 0-0-1; Ta 3 0-1-0, 4 0-1-1.

Epigynum and internal genitalia (Figs. 90-92): Epigynal projections situated at anterior part of atrium, long, pointed downward (Figs. 90-91). Copulatory opening located at underside of projections (Fig. 90). Spermathecal ducts wide, membranous; spermathecal head very small, nipple-shaped (Fig. 92); spermathecae convoluted, spermathecal bases small, widely separated (Fig. 92).

Markings and coloration almost same as in male holotype.

Other materials examined. 2 males and 2 females, 16 November 1997; Oono-san, Izena-jima, Okinawa Island, 3 males and 2 females 19 November 1999; Kushi-dake, Iheya-jima, Okinawa Islands.

Biology. This new species live in cliffy places, among the litter of leaves, rotten boughs and decaying tree holes in the wood; it constructs tubular nest with sheet web.

Distribution. Izena-jima and Iheya-jima, Okinawa Islands.

Coelotes kumejimanus n. sp.

[Japanese name: Ootake-yachigumo]

(Figs. 94-98)

Etymology. The specific name is derived from the type locality.

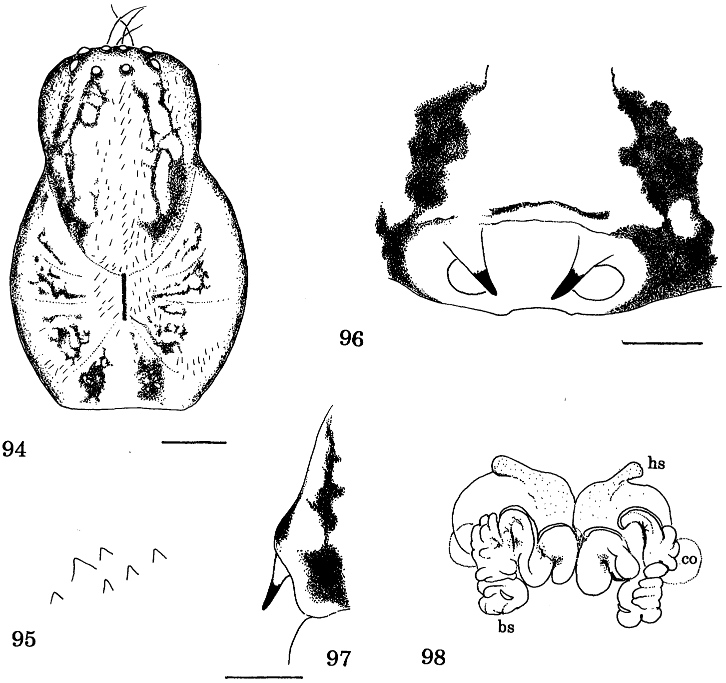
Types. Female holotype and 1 female paratype, Mt. Ootake (Mt. Hiyajo-dake), Kume-jima, Okinawa Islands, Okinawa Pref., Japan, 13 December 1998; deposited in NSMT.

Diagnosis. Total length of female body: 10.5-12.4 ($n=6$, $\bar{x}=11.6\pm0.8$ SD), the largest sized coelotine spider in the Ryukyu Islands. Number and arrangements of marginal teeth of chelicerae same as in *C. yambaruensis* n. sp. and *C. izenaensis* n. sp.. External feature and marking of this new species is also similar to *Coelotes yambaruensis* n. sp. but it can easily be distinguished by the shape of internal genitalia such as spermathecae, spermathecal ducts and spermathecal head. Spermathecal head of *Coelotes kumejimanus* n. sp. situated at upper side of the copulatory ducts; spermathecal bases of *C. kumejimanus* n. sp. small, widely separated from each other (Fig. 98).

Description. Female holotype: Total length 12.3, carapace 5.5 long, 3.9 wide; sternum shield shaped, 2.6 long, 2.3 wide; labium 0.8 long, 0.7 wide; height of clypeus 0.3, with 10 long bristles; both cheliceral margin of the right and left with 3 teeth; cervical groove, median furrow and radial furrows apparent. AER straight or slightly procurved, PER strongly recurved from dorsal view; AER and PER strongly procurved seen from front; order of eye size ALE=PLE>AME=PME; interdistances of eyes: AME-AME 0.08, AME-ALE 0.12, PME-PME 0.16, PME-PLE 0.24, ALE-PLE 0.06; MOAW=MOAH: Leg I 4.9/1.9/4.3/4.4/2.4/17.9//13(13)/5/9; Leg II 4.5/1.9/3.5/4.1/2.1/16.1//13(13)/4/9; Leg III 4.1/1.7/2.9/4.0/1.8/14.5//10(11)/3/7; Leg IV 5.0/1.9/4.3/5.6/2.3/19.1//12(13)/4/7. Leg formula 4, 1, 2, 3.

Spiniformation of left legs. Dorsal: Fe 1, 4 1-0-1-2-1, 2 1-1-1-2-1, 3 1-2-1-2-1; Pa 3, 4 1-0-1; Ti 3 1-1-0, 4 1-0-0; Mt 3 1-0-1, 4 1-2-2. Ventral: Ti 1, 2 2-2-1, 3, 4 2-2-2; Mt 1, 3, 4 2-2-2, 2 2-2-3. Prolateral: Pa 4 0-1-0; Ti 4 1-1-0; Mt 1 0-0-1, 4 1-1-1; Ta 4 0-1-0. Retrolateral: Fe 1 0-0-1; Pa 2-4 0-1-0; Ti 2, 4 1-1-0, 3 0-1-0; Mt 2 1-0-0, 3 0-1-1, 4 0-0-1; Ta 3 0-1-0, 4 0-1-1.

Epigynum and internal genitalia (Figs. 96-98): Epigynal projections located at anterior portion of atrium, projections stout, long and pointed (Figs. 96-97). Spermathecal head nipple-shaped, situated at upper side of spermathecal ducts, spermathecal ducts membranous, middle expanded, close together; spermathecae twisted and convoluted, spermathecal bases widely separated from each other (Fig. 98).



Figs. 94–97. *Coelotes kumejimanus* n. sp., female holotype, —— 94, carapace; 95, left cheliceral teeth. 96–97, Epigynum: 96, ventral; 97, lateral. 98, dorsal view of internal genitalia. Scale bar = 1 mm;

Markings and coloration: Dorsum of carapace with unique shaped blackish grey marks as shown in Fig. 94; both longitudinal sides of epigynal part with large cloudy flecks (Figs. 96–97); distal part of epigynal projections with blackish grey color (Fig. 96).

Paratype: 2 females date and locality same as holotype.

Other meterials examined. 2 females, 13 December 1998; Mt. Ootake, Kume-jima, Okinawa Islands, 3 females, 11 November 1999; same locality as holotype.

Biology. *Coelotes kumejimanus* n. sp. lives in wood. Habitats and nest are very similar to those of *Coelotes izenaensis* n. sp.

Remarks. Male unknown.

Distribution. Kume-jima Is. in the Okinawa Islands.

Acknowledgments

I wish to expressmy hearty thanks to Dr. J. Haupt, Institut für Ökologie und Biologi Technische Universität Berlin, for critical reading of the manuscript, to Dr. M. Nishihira, Biological Institute, Graduate School of Science, Tohoku University, and to Dr. N. Tsurusaki, Tottori University, for their valuable suggestions.

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なお，*Aphantaulax* ホソミトンビグモ属（新称）のクモが日本から記録されたのは初めてである．

琉球列島産ヤチグモ属 11 新種（pp. 165–189）
下謝名松榮（〒903-0129 沖縄県西原町千原 1 番地　琉球大学教育学部）
尖閣列島，宮古諸島および沖縄諸島から採集した標本に基づき，次の 11 新種を記載した．これらの種はすべて琉球列島固有のものである．*Coelotes senkakuensis* センカクヤチグモ，*C. miyakoensis* ミヤコヤチグモ，*C. keramaensis* ケラマヤチグモ，*C. kumejimanus* オオタケヤチグモ，*C. aguniensis* アグニヤチグモ，*C. tonakiensis* トナキヤチグモ，*C. motobuensis* モトブヤチグモ，*C. shimajiriensis* シマジリヤチグモ，*C. yambaruensis* ヤンバルヤチグモ，*C. izenaensis* イゼナヤチグモ，*C. iheyaensis* イヘヤヤチグモ．

奄美諸島とトカラ列島産ヤチグモ属 7 新種（pp. 191–204）
下謝名松榮（〒903-0129 沖縄県西原町千原 1 番地　琉球大学教育学部）
奄美諸島とトカラ列島産のヤチグモ属の下記の 7 新種について記載した．*Coelotes oshimaensis* オオシマヤチグモ，*C. tokunoshimaensis* トクノシマヤチグモ，*C. tokaraensis* トカラヤチグモ，*C. insulanus* シマヤチグモ，*C. nasensis* ナセヤチグモ，*C. akakinaensis* アカキナヤチグモ，*C. kakeromaensis* カケロマヤチグモ．全種とも琉球列島の固有種であり，各種の分布域はきわめて狭い範囲に限られている．

***Larinia bonneti* ボネコガネグモダマシ（新称）の日本からの新記録**（pp. 205–207）
谷川明男（〒248-0025 神奈川県鎌倉市七里ガ浜東 2-3-1　神奈川県立七里ガ浜高等学校）
Larinia bonneti Spassky 1939 ボネコガネグモダマシ（新称）を日本新記録として報告し，図示し，再記載した．本種は体が小さいこと，外雌器の垂体が薄くて丸みを帯びていること，雄触肢の指示器が細長くとがっていること，盾に大きくて薄い突起があることによって容易に日本産の同属の他種と見分けることができる．

書　評

クモの生物学
宮下　直（編）(2000)
東京大学出版会，A5 判，267pp.
ISBN 4-13-060207-1，5,200 円（税別）

編者の前文にもあるとおり，本書は，クモという動物がいかに魅力的な研究対象であるかを多くの人に理解してもらうために，専門の研究者が意欲的に取り組んでいる研究内容を最新の知見を交えながら紹介することを意図して刊行された．まずこの姿勢はすばらしく，本書はその役目を果たしていると思われる．

同じ「クモの生物学」という題名の本に吉倉真（学会出版センター，1987）のものがあるが，それを意識した上で，内容が専門外の人には読みにくい点を改め，吉倉の出版後今日までに蓄積された新知見を補った．

本書は系統と進化（鶴崎展巨，田中一裕，中嶋暉躬），糸と網（吉田真，大崎茂芳，宮下直），

